WHAT IS CLAIMED IS:

1. A semiconductor device comprising:

a silicon substrate;

a gate insulation film formed over said silicon substrate; and

a gate electrode formed over said gate insulation film,

silicon atoms on a surface of said silicon substrate being displaced toward said gate insulation film side.

2. The semiconductor device according to claim 1, wherein a conductive type of said surface of said silicon substrate is P-type below said gate insulation film.

3. The semiconductor device according to claim 1, wherein a displacement amount of said silicon atoms on said surface of said silicon substrate is 0.0075 nm or more.

4. The semiconductor device according to claim 3, wherein said displacement amount is 0.01 nm to 0.03 nm.

5. A semiconductor device comprising:

a silicon substrate;

a gate insulation film formed over said silicon substrate; and

a gate electrode formed over said gate insulation film,

silicon atoms on a surface of said silicon substrate in a region where a conductive type of said surface is P-type below said gate insulation film being displaced toward said gate insulation film side, and

silicon atoms on said surface in a region where said conductive type of said surface is N-type below said gate insulation film being displaced toward an inner side of said silicon substrate.

6. The semiconductor device according to claim 5, wherein

a displacement amount of said silicon atoms in said region where the conductive type of said surface is N-type is 0.01 nm to 0.03 nm, and

a displacement amount of said silicon atoms in said region where the conductive type of said surface is P-type is 0.01 nm or less.

7. The semiconductor device according to claim 1, wherein said gate insulation film comprises:

a silicon oxide film containing nitrogen and formed over said silicon substrate; and

a silicon nitride film or high dielectric constant film formed over said silicon oxide film.

8. The semiconductor device according to claim 1, wherein said gate insulation film comprises:

a silicon oxide film containing nitrogen and formed over said silicon substrate;

a high dielectric constant film formed over said silicon oxide film; and

a silicon nitride film formed over said high dielectric constant film.

9. A manufacturing method of a semiconductor device comprising the steps of:

forming a gate insulation film over a silicon substrate; and

forming a gate electrode over said gate insulation film,

said step of forming a gate insulation film including the steps of:

forming a silicon oxide film over said silicon substrate; and

introducing nitrogen into said silicon oxide film and displacing silicon atoms on a surface of said silicon substrate toward said gate insulation film side.

10. The method according to claim 9, wherein said step of introducing nitrogen and displacing silicon atoms comprises the step of conducting a first heat treatment to said silicon oxide film in an ammonia atmosphere or nitrogen monoxide atmosphere.

11. The method according to claim 9, wherein said gate insulation film is formed over a region where a conductive type of said surface of said silicon substrate is P-type.

12. A manufacturing method of a semiconductor device comprising the steps of:

forming a gate insulation film over a silicon substrate; and

forming a gate electrode over said gate insulation film,

said step of forming a gate insulation film including the steps of:

forming a silicon oxide film over said silicon substrate; and

introducing nitrogen into said silicon oxide film, displacing silicon atoms on a surface of said silicon substrate in a region where a conductive type of said surface is P-type below said gate insulation film toward said gate insulation film side, and displacing silicon atoms on said surface in a region where said conductive type of said surface is N-type below said gate insulation film toward an inner side of said silicon substrate.

13. The method according to claim 12, wherein said step of introducing nitrogen and displacing silicon atoms comprises the step of conducting a first heat treatment to said silicon oxide film in a ammonia atmosphere or nitrogen monoxide atmosphere in said region where the conductive type of said surface is P-type, and conducting a plasma nitridation treatment to said silicon oxide film in an ammonia atmosphere or nitrogen monoxide atmosphere in said

region where the conductive type of said surface is N-type.

14. The method according to claim 10, wherein said first heat treatment is conducted at 775°C or higher.

15. The method according to claim 9, wherein said step of forming a gate insulation film comprises the step of forming a silicon nitride film or high dielectric constant film over said silicon oxide film, after said step of introducing nitrogen and displacing silicon atoms.

16. The method according to claim 15, wherein said step of forming a gate insulation film comprises the step of conducting a second heat treatment to said silicon oxide film, to which nitrogen has been introduced, after said step of forming a silicon nitride film or high dielectric constant film.

17. The method according to claim 16, wherein said second heat treatment is conducted at a higher temperature than that at which said silicon nitride film or high dielectric constant film is formed.

18. The method according to claim 9, wherein said step of forming a gate insulation film comprises the steps of, after said step of introducing nitrogen and displacing silicon atoms:

forming a high dielectric constant film over said silicon oxide film;

conducting a second heat treatment to said silicon oxide film, to which nitrogen has been introduced; and

forming a silicon nitride film over said high dielectric constant film.

19. The method according to claim 16, wherein said second heat treatment is conducted in a nitrogen monoxide atmosphere.

20. The method according to claim 9, wherein said silicon oxide film is 1.5 nm or less in thickness.